

Minutes of Radiation Safety Committee of February 13, 2001

Review of E951 in A3 Line

Present: L. Ahrens, I.H. Chiang, A. Etkin, W. Glenn, G. Greene, R. Karol, H. Kirk, E. Lessard, W. MacKay, R. Prigl, J. Scaduto, C. Schaefer, A. Stevens

I. Agenda

It was agreed at the start of the meeting to limit discussions to the topics of shielding (mostly modifications made following a previous RSC subcommittee review on 10/11/2000) and target containment.

II. Shielding

The shielding configuration presented had been changed in response to the previous subcommittee review. In particular, concrete now overlays what had been a bare steel roof, and the west side of the end wall has been thickened.

The A3 line shield (composed of steel, concrete and heavy concrete) has weak spots on both the east and west sides at the position of the building wall. An interior "shadow shield" exists to ameliorate this situation, but the levels at these "hot spots" are still estimated to be about 15 times the levels through the shield at 90 degrees.

The shield should limit the levels in normal operation to be less than: (1) 2.5 mr/hr "in general", 10 mr/hr for the "hot spots", and 100 mr/hr on the roof to which access must be excluded. The level in the parking lot should be less than 1 mrem, and should be monitored regularly by HP as discussed in IV below.

Five chipmunks are currently planned, one on the roof and two at the hot spots, and at 90 degrees with respect to a quadrupole immediately upstream of the target, which is the expected aperture for a mis-steered beam. A floor trench under the line exists at this point, which is mostly filled with poured concrete for a length of 8 ft. on both sides of the beam line. The chipmunks should be set to trip at 20 mr/hr but alarm at 2 mr/hr.

Current limits (maximum and minimum) are planned on A1D3/A1D4 and A1D5-7 to ensure that the beam stays on the beam stop. Additional information is needed regarding the beam position when the current is actually at the limits and in the event of a failure of the limits. Current trip points should be an item on the RSC check list. ACS group to sign off (**CK-A3-2001-223**)

A sub-committee consisting of R. Karol, C. Schaefer, and A. Stevens should meet with R. Prigl to discuss and report on the following: (1) levels outside the shield during normal operation, (2) levels when the beam is 'at the limits' of the current comparitors, (3) levels when the beam is totally mis-steered, (4) places where tld's should be placed to provide useful information of radiation history during the run. The sub-committee should report to the RSC chair and the RSC Chair should sign off an item on the check list stating that the report has been completed (**CK-A3-2001-224**).

III Targets and Target Region

All targets are within a secondary containment vessel. The planned targets are (1) a selection of candidate windows including Inconel, Stainless, 'Havar' (a special steel), and aluminum, (2) 2 1-ft long carbon rods, and (3) an Hg jet about 1 ft. long. The LE should sign off that the targets are as described (**CK-A3-2001-225**)

The beam limits (to be established by administrative control) depend on the target being used. They are shown in the following table:

Target	Limit per pulse	Limit per hour
No target	1 TP	1×10^{15}
Light target	10 TP	1×10^{15}
Heavy target	10 TP	1×10^{14}

These limits apply to the current (FY2001) running period. The LP should sign off that a procedure is in place to keep to these limits (**CK-A3-2001-226**)

The experimenters do not foresee a need for entry sooner than 15 minutes after beam turnoff. An HP survey is required before entry. A radiation work permit is required for removal of the light targets from the secondary containment, and a transport permit may be required to move these targets to another department. An item on the check off list to be signed off by R. Karol is that necessary permits are on file (**CK-A3-2001-227**)

One of the committee members (E. Lessard) stated that he did not think that air activation was a problem. This was not discussed, however, and the RSC Chair may wish to follow-up on this question since the vacuum pipe ends about 50 ft. upstream of the beam stop face.

A question arose concerning the trapped gas around the Hg jet target. If Argon is used, an estimate of ^{41}A which might be released to the air should be made. W. Glenn volunteered to investigate this question and should sign off on a check list item that this is not a problem (**CK-A3-2001-228**).

A memorandum-of-understanding is needed from the future owner of the Hg that accepts ownership and outlines plans for storing the Hg after irradiation. This MOU is needed before irradiation takes place. The ES&H Chair should sign off that a memo. is on file (**CK-A3-2001-229**)

IV. HP Instructions

HP should make reasonably frequent surveys in the areas when E951 runs and ensure that posting is correct. Smear tests should be periodically performed on the target vessels and the entrance to the beam stop. An item of the RSC check-off list should be sign-off by the HP Supervisor that a survey schedule exists which includes the parking area (**CK-A3-2001-230**)

V. Unreviewed Topics

The access system was not reviewed at this meeting. The RSC Chair should appoint a sub-committee for this purpose.

A second Hg target (being designed at CERN) may be irradiated. If so, a follow-up review is needed when plans for this target become finalized and specific.

Conventional hazards associated with the targets and their containment, especially those associated with thermal shock and stress, have not been reviewed. We request the Experimental Safety Review Committee to review this.

A needed item on the RSC check list is that the ESRC has reviewed and resolved concerns associated with conventional safety (**CK-A3-2001-231**).

Distribution:

Attendees
RSC membership
Y. Makdisi

Cc: RSC file